

# **USER'S GUIDE**

## **2 Gbit/s Fibre Channel to PCI-X Host Adapters**

*Version 2.0*

**April 2003**



## Electromagnetic Compatibility Notices

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

LSI Logic is not responsible for any radio or television interference caused by unauthorized modification of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by LSI Logic. The correction of interferences caused by such unauthorized modification, substitution, or attachment will be the responsibility of the user.

The LSI Logic 2 Gbit/s PCI-X Host Adapters, model numbers LSI7102XP-LC, LSI7202XP-LC, and LSI7402XP-LC are tested to comply with FCC standards for home or office use.

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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The host adapter(s) referred to in this User's Guide contain one or more transceivers that are certified as Class 1 laser products that conform to the requirements contained in the US Food and Drug Administration - Center for Devices and Radiological Health (FDA/CDRH) regulation 21 CFR 1040, Performance Standards for Light-Emitting Products and 21 CFR 1010, Performance Standards for Electronic Products: General.

Internationally, these transceivers are certified as Class 1 laser products that conform to the requirements contained in the International Electrotechnical Commission (IEC) standard 825-1 (1993). Class 1 laser products are not considered to be hazardous based upon current medical knowledge. This class includes all lasers or laser systems which cannot emit levels of optical radiation above the exposure limits for the eye under any exposure conditions inherent in the design of the laser product. The design of the transceivers on this host adapter is such that access to laser radiation above a Class 1 emission level during operation, user maintenance, or service conditions is prevented. However, there may be a laser embedded in the enclosure of the Class 1 laser that is more hazardous, but harmful radiation cannot escape the intact enclosure. With any laser, the following precautions should be followed to prevent accidental exposure to any levels of optical radiation.

**CAUTION:** Do not look into the transceiver ports, do not view the transceiver ports with optical instruments, and avoid direct exposure to the beam.

The following certification information is permanently affixed to or inscribed on the transceiver product so as to be legible and readily accessible to view when the transceiver is fully assembled for use.

- Laser Manufacturer
- Model #
- Serial #

Document DB15-000264-01, Second Edition (April 2003)

This document describes the LSI Logic family of 2 Gbit/s Fibre Channel to PCI-X host adapters and will remain the official reference source for all revisions/releases of this product until rescinded by an update.

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# Preface

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This book is the primary reference and user's guide for the LSI Logic family of 2 Gbit/s Fibre Channel to PCI-X Host Adapter boards. It contains a complete functional description of these boards as well as complete physical and electrical specifications.

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## Audience

This document assumes that you have some familiarity with Fibre Channel protocol and related support devices and will benefit persons installing and using these boards.

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## Organization

This document has the following chapters:

- [Chapter 1, Installation Procedures](#), provides both quick and detailed installation instructions.
  - [Chapter 2, 2 Gbit/s PCI-X Host Adapter Characteristics](#), describes the physical and operational environments of the host adapters.
  - [Chapter 3, Firmware Installation Procedure](#), describes the installation procedures for the Fusion-MPT™ and Fibre Channel drivers.
  - [Chapter 4, BIOS Features](#), describes the installation procedures for the Fibre Channel BIOS and Configuration Utility.
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## Related Publications

*LSIFC929X Dual Channel Fibre Channel I/O Processor Technical Manual*, April 2003 (LSI Order # DB14-000202-01)

*LSIFC919X Single Channel Fibre Channel I/O Processor Technical Manual*, April 2003 (LSI Order # DB15-000225-01)

*Fusion-MPT™ Device Management User's Guide*, August 2002 (LSI Order # DB15-000186-01)

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## **Revision Record**

<b>Revision</b>	<b>Date</b>	<b>Remarks</b>
1.0	10/02	First printing (Preliminary).
2.0	04/03	Final printing.

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## **Customer Feedback**



# Chapter 1

## Installation Procedures

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This chapter contains general information about the LSI Logic 2 Gbit/s family of Fibre Channel (FC) to PCI-X host adapters. It also provides host adapter installation instructions. This chapter describes these topics:

- [Section 1.1, “General Description,” page 1-1](#)
- [Section 1.2, “Quick Installation Procedure,” page 1-2](#)
- [Section 1.3, “Detailed Installation Procedure,” page 1-2](#)

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### 1.1 General Description

LSI Logic provides high-performance, cost-effective 2 Gbit/s Fibre Channel (FC) to PCI-X controllers and host adapters. The LSI Logic controllers and their associated host adapters that support 2Gbit/s Fibre Channel and PCI-X contained in this Guide are:

Controller	Host Adapter
LSIFC919X	LSI7102XP-LC
LSIFC929X	LSI7202XP-LC, LSI7402XP-LC

Installing these adapters into your PCI-X system allows you to connect Fibre Channel devices. You can use the Fibre Channel boards in PCI-X computer systems with either a standard or Low Profile PCI (LPPCI) bracket type.

For specific information about the Fibre Channel controllers, refer to the related publications section in the Preface.

## 1.2 Quick Installation Procedure

This section provides an overview of the installation procedure. If you are an experienced computer user with prior host adapter installation and FC setup experience, this section may sufficiently describe the procedure for you. If you prefer more detailed guidance for installing the host adapter, proceed to [Section 1.3, "Detailed Installation Procedure."](#)

For safe and proper installation, check the user's manual supplied with your computer and perform the following steps.

- Step 1. *Ground yourself* before removing this host adapter board.
- Step 2. Remove the host adapter from the packing and check that it is not damaged.

[Figure 1.1](#) illustrates an example of this host adapter board. Also refer to [Chapter 2](#) to see more detailed drawings of the 2 Gbit/s host adapter boards.

- Step 3. Open your PC cabinet and select an appropriate open PCI slot.
- Step 4. Insert the host adapter board.
- Step 5. Make any configuration changes.
- Step 6. Close your PC cabinet cover.
- Step 7. Connect the FC cable to the host adapter.

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## 1.3 Detailed Installation Procedure

This section provides step-by-step instructions for installing the host adapter. If you are experienced in these tasks, you may prefer to use [Section 1.2, "Quick Installation Procedure."](#)

### 1.3.1 Before You Start

Before starting, look through the following task list to get an overall idea of the steps you will be performing. If you are not confident you can perform the tasks as described here, LSI Logic recommends getting assistance.

Each FC host adapter channel that you install can act as host for up to 126 Arbitrated Loop FC devices, not including the adapter itself. Follow the detailed instructions in the next section to successfully install your host adapter board.

### **1.3.2 Inserting the Host Adapter**

For safe and proper installation, use the user's manual supplied with your computer. Perform the following steps to install the host adapter.

- Step 1. *Ground yourself* before removing this host adapter board.
- Step 2. Remove the host adapter from the packing and check that it is not damaged.

[Figure 1.1](#) illustrates an example of this host adapter board. Also refer to [Chapter 2](#) to see more detailed drawings of the 2 Gbit/s host adapter boards.

- Step 3. Switch off the computer and unplug power cords for all components in your system.
- Step 4. Remove the cover from your computer per the instructions in the user's manual for your system to access the PCI slots.

**Caution:** *Ground yourself* by touching a metal surface before removing the cabinet top. Static charges on your body can damage electronic components. Handle plug-in boards by the edge; do not touch board components or gold connector contacts. The use of a static ground strap is recommended.

- Step 5. Locate the slots for PCI plug-in board installation.

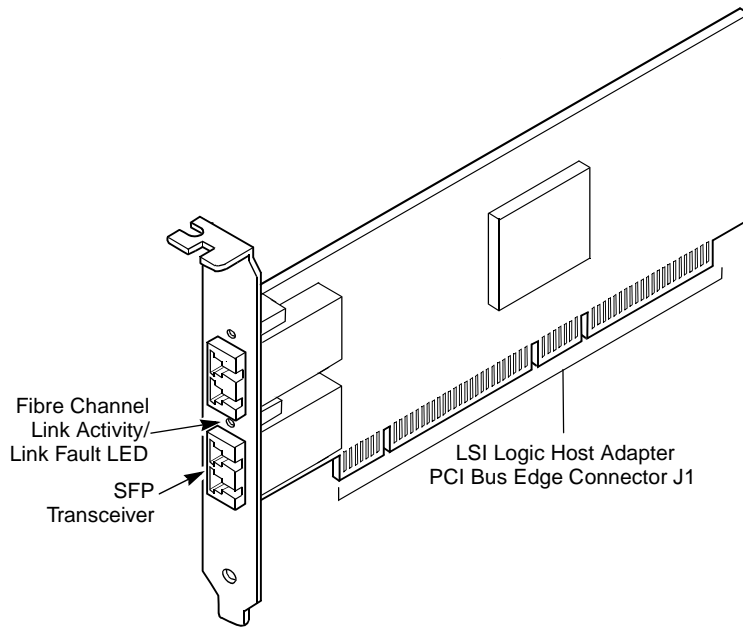
Refer to the computer's user's manual to confirm the location of the PCI slots.

This host adapter requires a 32-bit or 64-bit PCI slot that allows bus master operation. If a 32-bit PCI slot is used, the portion of the J1 connector opposite the bracket remains uninserted. See [Figure 1.2](#).

**Note:** For this host adapter to function as a 64-bit device, it must be inserted in a 64-bit PCI slot. If the host adapter is inserted in a 32-bit PCI slot, it will function as a 32-bit device.

- Step 6. Remove the blank bracket panel on the back of the computer aligned with the PCI slot you intend to use. Save the bracket screw.

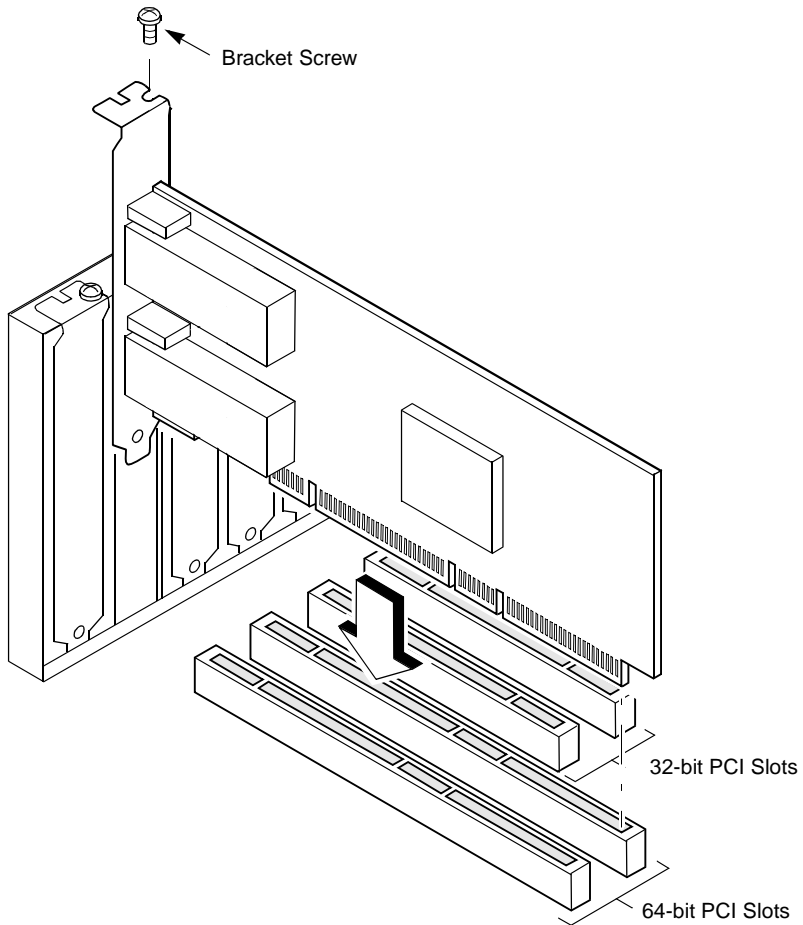
**Figure 1.1 Hardware Connections for the LSI Logic Host Adapter**



- Step 7. Carefully insert edge connector J1 (see [Figure 1.1](#)) of the host adapter into the PCI slot.

Make sure the edge connector is properly aligned before pressing the board into place as shown in [Figure 1.2](#). The bracket around the SFP cages should fit where you removed the blank panel.

**Figure 1.2 Inserting the Host Adapter**



Step 8. Secure the board with the bracket screw (see [Figure 1.2](#)), then make the external FC link connection.





# Chapter 2

## 2 Gbit/s PCI-X

### Host Adapter

### Characteristics

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This chapter provides specific details about the physical environment associated with the 2 Gbit/s family of Fibre Channel to PCI-X host adapters. This chapter includes these topics:

- [Section 2.1, "General Description," page 2-1](#)
  - [Section 2.2, "Features," page 2-3](#)
  - [Section 2.3, "Physical Environment," page 2-5](#)
  - [Section 2.4, "Operational Environment," page 2-6](#)
  - [Section 2.5, "IEEE Unique Address," page 2-7](#)
  - [Section 2.6, "Physical Characteristics," page 2-8](#)
- 

## 2.1 General Description

The LSI Logic 2 Gbit/s family of Fibre Channel to PCI-X host adapters makes use of state of the art 2 Gbit/s Fibre Channel technology to provide the highest possible performance and most flexible storage configuration available. These LSI Logic host adapters support 1Gbit/s or 2 Gbit/s Fibre Channel speeds, and will detect and correctly set the speed of operation automatically. LSI Logic host adapters are available with LC optical interfaces using optical SFP transceivers.

These LSI Logic Fibre Channel host adapters offer the highest degree of integration available for your PCI-X based computer system, allowing for maximum performance, optimized use of system resources, and true Plug and Play installation.

This manual will serve as a step by step guide during the installation of your LSI Logic host adapter.

[Table 2.1](#) lists the 2 Gbit/s Fibre Channel to PCI-X host adapters discussed in this user's guide.

**Table 2.1 LSI Logic 2 Gbit/s Fibre Channel to PCI-X Host Adapter Descriptions**

Adapter	Description
LSI7102XP-LC	2 Gbit/s, Single-port, standard height bracket, optical
LSI7202XP-LC	2 Gbit/s, Dual-port, standard height bracket, optical
LSI7402XP-LC	2 Gbit/s, Quad-port, standard height bracket, optical

## **2.1.1 Hardware and Software Support**

The LSI Logic 2 Gbit/s family of Fibre Channel to PCI-X host adapter supports most major software operating systems, such as Sun Solaris (2.6 and greater), Windows Server (NT 4.0, 2000, XP, .NET), Linux (RedHat, Suse, Caldera, Turbo), NetWare, UnixWare, HP-UX, and OS/2. These host adapters utilize the Fusion-MPT architecture for all major operating systems. Fusion-MPT architecture offers the unique feature of having a single binary, operating system driver that supports Fibre Channel devices and other bus architectures. For more information regarding software support for this family of host adapters, see the *Fusion-MPT Device Management User's Guide*.

Before you use any of this family of host adapters, make sure your system meets the specific hardware and software requirements shown in Table 2.2.

**Table 2.2 Hardware and Software Requirements**

Component	Requirements
<b>For Solaris SPARC hardware environments</b>	
Hardware	Any Sun Microsystems computer with a 3.3V PCI slot
Software	Solaris 8 operating environment
Firmware	OpenBoot PROM, version 2.1 or greater
<b>For Intel IA-32 or IA-64 hardware environments</b>	
Hardware	Any Intel compatible with 3.3 V PCI slots
Software	Windows Server (NT 4.0, 2000, XP, .NET) Linux (RedHat, Suse, Caldera, Turbo) NetWare, UnixWare, HP-UX, and OS/2
Firmware	Any Intel compatible BIOS system

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## 2.2 Features

This section provides an overview of the [PCI-X Interface](#) and the [FC Interface](#) for the 2 Gbit/s family of host adapters.

### 2.2.1 PCI-X Interface

PCI-X interfaces I/O components to the processor and memory subsystems in equipment ranging from PCs to servers. The PCI-X interface operates as a 64-bit DMA bus master capable of 64-bit addressing.

The PCI-X interface includes these features:

- Full 64-bit DMA bus master
- LSIFC929X/LSIFC919X functionality:
  - Zero wait-state bus master data bursts up to 1 Kbyte
  - Host adapters comply with PCI Local Bus Specification, Rev. 2.2

- 3.3 V interface
- Serial EEPROM configuration storage
- Host adapters comply with PCI-X/133 Specification, Rev. 1.0a

## **2.2.2 FC Interface**

The LSIFC929X/LSIFC919X contain the FC functionality for all the LSI Logic 2 Gbit/s Fibre Channel to PCI-X host adapters. The LSIFC929X/LSIFC919X generate signal timing and link protocol in compliance with FC standards.

The FC interface includes these features:

- 2 Gbit/s serial link
- LSIFC929X/LSIFC919X functionality:
  - Class 3, Arbitrated Loop (AL), Fabric, Point-to-Point
  - 2 Kbyte frame payloads
  - Multiframe buffering
- Link activity/link fault LED

## 2.3 Physical Environment

This section provides information about the physical, electrical, thermal, and safety characteristics of the LSI Logic 2 Gbit/s family of Fibre Channel to PCI-X host adapters. Additionally, these boards are compliant with electromagnetic standards set by the FCC.

### 2.3.1 Electrical Characteristics

Table 2.3 lists the maximum power requirements, and includes all of the LSI Logic 2 Gbit/s Fibre Channel to PCI host adapter boards, under normal operation.

**Table 2.3 Maximum Power Requirements**

Host Adapter	PCI +3.3 V	Over the Operating Range
LSI7102XP-LC	1.25 A	0 °C to 55 °C
LSI7202XP-LC	1.75 A	0 °C to 55 °C
LSI7402XP-LC	4.0 A (3.3 V supply) plus 1.2 A (5.0 V supply)	0 °C to 55 °C

### 2.3.2 Thermal, Atmospheric Characteristics

The thermal, atmospheric characteristics of the LSI Logic 2 Gbit/s family of Fibre Channel to PCI-X host adapters are:

- Temperature range: 0 °C to 55 °C (dry bulb), 100 lfm air flow minimum
- Relative humidity range: 5% to 90% noncondensing
- Maximum dew point temperature: 32 °C

The following parameters define the storage and transit environment for these host adapters:

- Storage Temperature: –45 °C to +85 °C (dry bulb)
- Relative Humidity Range: 0% to 95% noncondensing

### **2.3.3 Electromagnetic Compliance**

These boards are designed and implemented to minimize susceptibility to electromagnetic emissions, and the effects of electromagnetic discharge. The boards are tested to comply with Class B and carry markings for CE, VCCI, Canada, C-Tick, and FCC.

### **2.3.4 Safety Characteristics**

The bare boards meet the requirements of flammability rating UL 94 V-0. The bare boards are also marked with the supplier's name or trademark, type, and UL flammability rating. Since these boards are installed in a PCI bus slot, all voltages are below the SELV 42.4 V limit.

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## **2.4 Operational Environment**

Use the LSI Logic 2 Gbit/s family of Fibre Channel to PCI-X host adapters in PCI-X computer systems with an ISA/EISA bracket type. The LSI Logic supplied FC BIOS and firmware operate the host adapters. An on-board flash memory device and a serial EEPROM are provided to allow BIOS code and open boot code support through PCI.

### **2.4.1 The PCI-X Interface**

The PCI-X interface operates as a 64-bit DMA bus master. The edge connector makes the PCI-X connection, which provides connections on both the front and back of the board. The signal definitions and pin numbers conform to the PCI-X/133 Specification, Revision 1.0a. See that specification for more details regarding the signal assignments.

Note: The LSI7202XP and the LSI7102XP derive power directly from the PCI +3.3V pins, while the LSI7402XP derives power from the PCI +3.3V pins and the PCI +5V pins. The LSI7202XP and LSI7102XP derive the LSIFC929X core voltage from the PCI +3.3V pins through a 1.8V regulator. The LSI7402XP derives the LSIFC929X core voltage from the PCI +5V pins through a 1.8V regulator, and the PCI-X Bridge core voltage from the PCI +3.3V pins through a 2.5V regulator. The PCI 3.3/5 V VIO pins are used to differentiate between a 5V or 3.3V PCI signaling environment.

## 2.4.2 The FC Interface

The FC interface varies, depending on which specific LSI Logic 2 Gbit/s host adapter you have selected. See Section 2.6 for more information.

## 2.4.3 The FC Link Activity/Link Fault LED

The LSI Logic 2 Gbit/s host adapters provide dual-purpose LEDs (one per port) visible through the bracket which indicate activity on the FC link. [Table 2.4](#) shows the appearance of the Link Activity/Link Fault LED for the given link status for each of the LSI Logic host adapters.

**Table 2.4     Appearance of LED to Represent Link Status**

Adapter	Link	Activity	Fault
LSI7102XP-LC	Off	Green Blinking	Yellow
LSI7202XP-LC	Off	Green Blinking	Yellow
LSI7402XP-LC	Off	Green Blinking	Yellow

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## 2.5 IEEE Unique Address

Each LSI Logic PCI-X host adapter is provided with a unique World Wide Name, specified by IEEE. The last twelve hexadecimal characters of this address appear on a label on the host adapter. This address is stored in the serial EEPROM on the host adapter.

## 2.6 Physical Characteristics

The LSI Logic 2 Gbit/s family of Fibre Channel to PCI-X host adapters includes one to four external Fibre Channel connectors, depending on the specific host adapter you have chosen. The host adapters are all available with optical or copper interconnects. No configuration of the adapter is necessary.

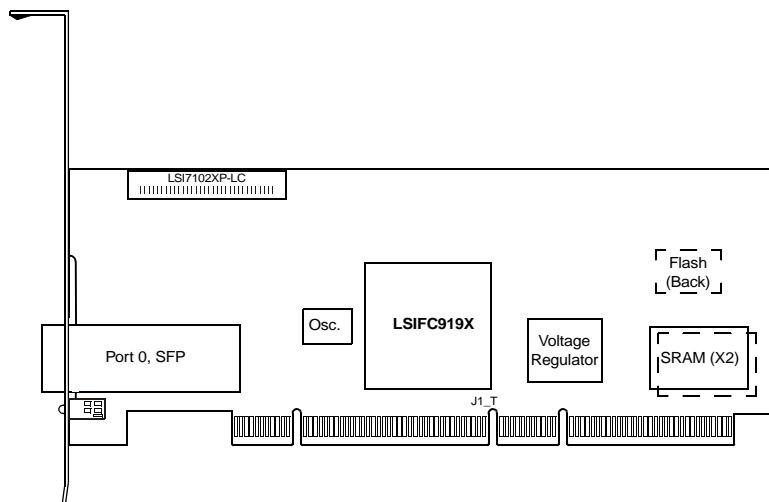
### 2.6.1 LSI7102XP-LC Host Adapter Configuration

The LSI Logic LSI7102XP-LC is a single channel 2 Gbit/s Fibre Channel adapter. One LC optical connector is used for I/O, which is accessible through the module bracket. The LSI7102XP-LC uses the LSIFC919X, providing one Fusion-MPT channel.

The LSI7102XP-LC is a PCI short card; the dimensions are 6.625 x 2.53 inches. The external FC connections are made through a 2 Gbit/s SFP optical module.

The component height on the top and bottom of the board conforms to the PCI-X/133 Specification, Revision 1.0a. [Figure 2.1](#) illustrates the major components on the LSI7102XP-LC.

**Figure 2.1 LSI7102XP-LC Host Adapter Configuration**





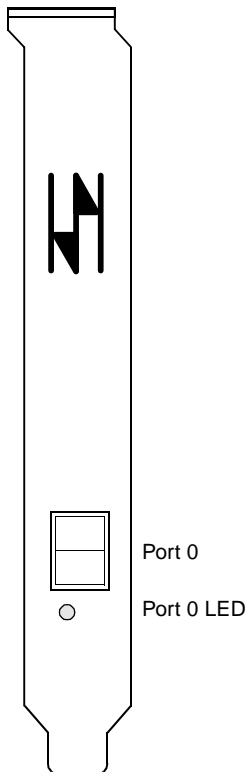
## 2.6.2 LSI7102XP-LC Connector and Indicator LED

The LSI7102XP-LC I/O bracket is configured as shown in [Figure 2.2](#) below. The LC connector is used to connect the adapter channel to the Fibre Channel subsystem. The indicator LEDs are used to indicate link status, activity, and link fault.

**Table 2.5     Link Activity/Link Fault LED for LSI7102XP-LC**

	Link	Activity	Fault
Appearance of LED	Off	Green Blinking	Yellow

**Figure 2.2     LSI7102XP-LC Connector and Indicator LED**



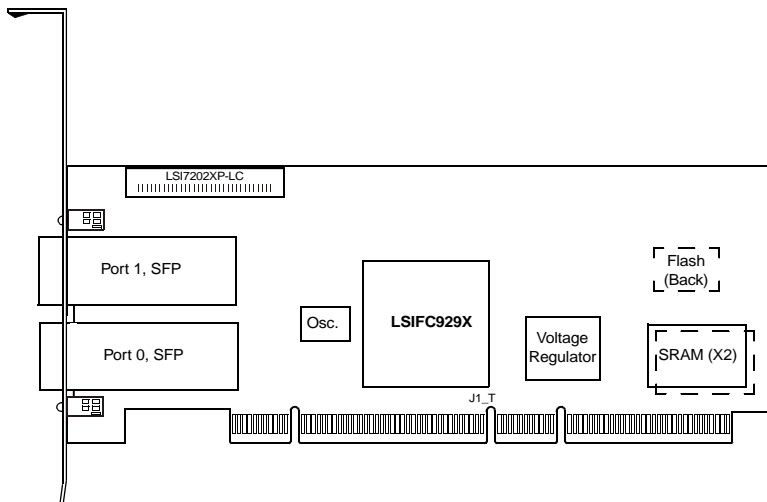
## 2.6.3 LSI7202XP-LC Host Adapter Configuration

The LSI Logic LSI7202XP-LC is a dual channel 2 Gbit/s Fibre Channel adapter. Two LC optical connectors are used for I/O, which are accessible through the module bracket. The LSI7202XP-LC uses the LSIFC929X, providing two Fusion-MPT channels.

The LSI7202XP-LC is a PCI short card; the dimensions are 6.625 x 2.53 inches. The external FC connections are made through the 2 Gbit/s SFP optical modules.

The component height on the top and bottom of the board conforms to the PCI-X/133 Specification, Revision 1.0a. [Figure 2.3](#) illustrates the major components on the LSI7202XP-LC.

**Figure 2.3 LSI7202XP-LC Host Adapter Configuration**



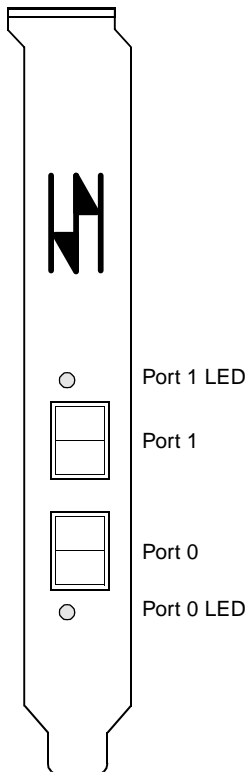
## 2.6.4 LSI7202XP-LC Connectors and Indicator LEDs

The LSI7202XP-LC I/O bracket is configured as shown in [Figure 2.4](#) below. The LC connectors are used to connect the adapter channels to the Fibre Channel subsystem. The indicator LEDs are used to indicate link status, activity, and link fault.

**Table 2.6 Link Activity/Link Fault LEDs for LSI7202XP-LC**

	Link	Activity	Fault
Appearance of LED	Off	Green Blinking	Yellow

**Figure 2.4 LSI7202XP-LC Connectors and Indicator LEDs**



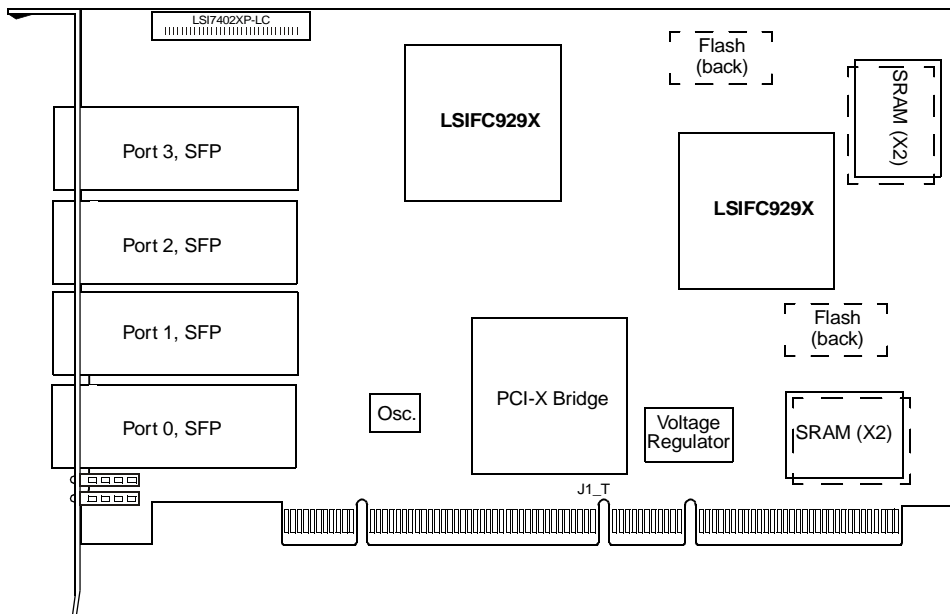
## 2.6.5 LSI7402XP-LC Host Adapter Configuration

The LSI Logic LSI7402XP-LC is a quad channel 2 Gbit/s Fibre Channel adapter. Four LC optical connectors are used for I/O, which are accessible through the module bracket. The LSI7402XP-LC uses two LSIFC929X devices, providing four Fusion-MPT channels.

The LSI7402XP-LC is a PCI short card; the dimensions are 6.875 x 4.2 inches. The external FC connections are made through the 2 Gbit/s SFP optical modules.

The component height on the top and bottom of the board conforms to the PCI-X/133 Specification, Revision 1.0a. [Figure 2.5](#) illustrates the major components on the LSI7402XP-LC.

**Figure 2.5 LSI7402XP-LC Host Adapter Configuration**



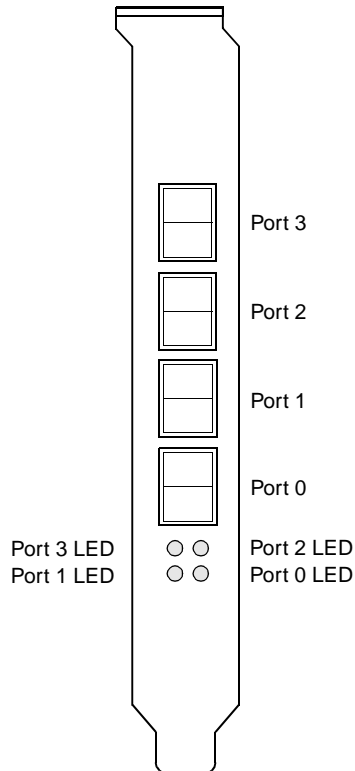
## 2.6.6 LSI7402XP-LC Connectors and Indicator LEDs

The LSI7402XP-LC I/O bracket is configured as shown in [Figure 2.6](#) below. The LC connectors are used to connect the adapter channels to the Fibre Channel subsystem. The indicator LEDs are used to indicate link status, activity, and link fault.

**Table 2.7 Link Activity/Link Fault LEDs for LSI7402XP-LC**

	Link	Activity	Fault
<b>Appearance of LED</b>	Off	Green Blinking	Yellow

**Figure 2.6 LSI7402XP-LC Connectors and Indicator LEDs**





# Chapter 3

## Firmware Installation Procedure

---

This chapter provides information about installing and configuring Fibre Channel firmware and includes these topics:

- [Section 3.1, "FC Firmware," page 3-1](#)
- [Section 3.2, "Installing the Firmware," page 3-3](#)
- [Section 3.3, "Configuring the Firmware," page 3-4](#)
- [Section 3.4, "Troubleshooting," page 3-7](#)

The LSI Logic Fibre Channel chips and host adapters contain firmware that presents a multi-protocol service layer based on the LSI Logic Fusion-MPT architecture. The Fibre Channel firmware provides FCP (SCSI-3 over Fibre Channel) Initiator, FCP Target, and LAN interface services to the host system.

The `FC929.ROM` file contains the firmware that supports the LSIFC929X or LSIFC919X chips and all associated host adapters.

---

### 3.1 FC Firmware

This section includes the features, description, installation, and configuration of the FC firmware.

### **3.1.1 Features**

The Fibre Channel firmware for the LSI Logic Fibre Channel chips supports these features:

- 1 Gbit/s and 2 Gbit/s Fibre Channel transfers, with Auto Negotiation (user selects 1 Gbit/s, 2 Gbit/s, or Auto)
- 64-bit/66 MHz host PCI bus and 133 MHz PCI-X bus (backward compatible with 32-bit/33 MHz)
- Transaction performance capability of >70,000 I/Os per second (both channels)
- Throughput capability of ~400 Mbytes/s, across 64-bit/66 MHz PCI (both channels)
- Low host CPU utilization
- Interrupt coalescing, tunable to system requirements
- Auto Topology Detection for Arbitrated Loop, Fabric Loop, or Direct Fabric attachment (user selects N\_Port, NL\_Port, or Auto)
- FC Class 3 support
- FC-Tape/FC-AL2 Class 3 confirmed delivery support
- LSI Logic Fusion-MPT common software interface
- Initiator, Target, and FC LAN capability

### **3.1.2 Description**

The LSIFC929X/LSIFC919X controllers operate in an environment where one or more host drivers serve as the interface layer between the operating system and the Fusion-MPT services provided by the LSI Logic Fibre Channel firmware. The host driver is responsible for initializing the controller, building request message frames, issuing request message frames to the controller, and processing reply message frames received from the controller.

The LSI Logic firmware translates Fusion-MPT message frames into Fibre Channel specific sequences, frames, and primitives that are delivered to the Fibre Channel transmit and receive physical interfaces. The firmware-based Link Services library provides all link service support used by the host for all FC topologies, transparently. The firmware also manages all link exceptions, which serves to isolate the host driver from



Fibre Channel unique exceptions. With the Fusion-MPT architecture, parallel SCSI host drivers can be used with the LSI Logic Fibre Channel controllers with little or no additional functionality for Fibre Channel.

---

## 3.2 Installing the Firmware

The Fibre Channel firmware may be updated using the Fibre Channel Flash Utility, which comprises an executable program called `FCUTIL.EXE`. This section provides the procedure for installing this program.

### 3.2.1 Installing the FcUtil Program

Use the `FcUtil` program to update the LSI Logic FC Firmware on an LSIFC929X or LSIFC919X Fibre Channel chip or host adapter. Locate the `FCUTIL.EXE` program and `FC929.ROM` code on your distribution media, as well as the `DOS4GW.EXE` file. Copy these files to a blank, formatted diskette. Label it "FC Firmware diskette."

To update the LSIFC929X (or LSIFC919X) firmware, complete the following steps:

- Step 1. Ensure that the host adapter is properly installed in the system PCI slot.
- Step 2. Insert the LSI Logic FC Firmware diskette into drive A:.
- Step 3. Boot the system to the DOS prompt `A:\>`.
- Step 4. Execute the `FCUTIL` program directly from the DOS command line by typing at the prompt:

```
A:\ fcutil
```

The `FcUtil` program identifies all LSI Logic host adapters in the system, and allows you to select which adapter to update.

- Step 5. The `FCUTIL` program displays a menu of options.

To update the firmware, select the option **a - Update Firmware**. The update process requires about 20–30 seconds.

- Step 6. Exit the `FCUTIL` utility using the menu option **q - Quit**.

## 3.3 Configuring the Firmware

The LSI Logic firmware supports several configuration options, defined individually below. All options may be configured using the `FCUTIL` utility menu, as described in [Section 3.2.1, "Installing the FcUtil Program."](#)

### 3.3.1 Link Speed

The link speed of these host adapters is configurable. By default, the link speed is set to Auto, meaning the host adapter automatically detects the link speed of all other nodes on the link, and automatically adjusts itself to work with those nodes. If for some reason this automatic operation fails (e.g., other nodes on a loop not supporting Auto Negotiation), the LSI Logic host adapters may be configured to either the 2 Gbit/s or 1 Gbit/s speed, specifically.

Note that the LSI7202XP has two FC ports and the LSI7402XP has four FC ports, so the link speed must be configured for each port. The LSI7102XP has only one port.

Step 1. To set the link speed of the host adapter, execute this command from DOS:

```
A:\ fcutil
```

The `FCUTIL` program identifies all LSI Logic host adapters in the system, and allows you to select which adapter to update.

Step 2. The `FCUTIL` program displays a menu of options.

To change the link speed on the LSI7202XP-LC Port 0, select one of the following menu options:

- f - Change Port 0 Board Speed to 1GB
- g - Change Port 0 Board Speed to 2GB
- h - Change Port 0 Board Speed to Auto

To change the link speed on the LSI7202XP-LC Port 1, select one of the following menu options:

- i - Change Port 1 Board Speed to 1GB
- j - Change Port 1 Board Speed to 2GB
- k - Change Port 1 Board Speed to Auto

Step 3. Exit the FCUTIL utility using the menu option **q** - **Quit**.

### **3.3.2 Interrupt Coalescing**

These host adapters have the ability to complete multiple I/O requests per host interrupt. This ability may be enabled or disabled. When enabled, the Interrupt Coalescing depth and timeout values are configurable. These values may be used to tune host adapter performance within a system environment.

Note that the LSI7202XP has two FC ports, and the LSI7202XP has four FC ports, so Interrupt Coalescing must be configured for each port. The LSI7102XP has only one port.

Step 1. To set Interrupt Coalescing for the host adapter, execute this command from DOS:

```
A:\ fcutil
```

The FCUTIL program identifies all LSI Logic host adapters in the system, and allows you to select which adapter to update.

Step 2. The FCUTIL program displays a menu of options.

To change Interrupt Coalescing on the LSI7202XP-LC Port 0, select the following menu option:

```
1 - Change Interrupt Coalescing Values on Port 0
```

The current values are displayed within a submenu, which allows the values to be changed:

```
--- IOC Page 1 ---
1) Flags ..... 0x0001
2) Coalescing Timeout ... 0x500
3) Coalescing Depth ..... 0x9
```

By default, the host adapter has Interrupt Coalescing enabled, as indicated by the Flags value of 0x0001. If Interrupt Coalescing needs to be disabled, enter a value of 0x0000 for Flags. Interrupt Coalescing should only be disabled to resolve issues in very unique system configurations. Please consult with LSI Logic Host Adapter Support to verify the need to disable Interrupt Coalescing for specific system configurations.

The Coalescing Timeout value determines how long the host adapter waits before generating an interrupt, when less than Coalescing Depth I/O requests are present. By default, the host adapter is pre-programmed with a value of 0x500  $\mu$ sec. This default value is optimized for very high performance servers and peripherals. The user can decrease this value to improve system performance, if the system contains lower performance servers and/or peripherals.

The Coalescing Depth value determines how many requests are queued before generating an interrupt. By default, the host adapter is pre-programmed with a value of 0x9. This default value is optimized for very high performance servers and peripherals. The user can decrease this value to improve system performance, if the system contains lower performance servers and/or peripherals.

## 3.4 Troubleshooting

Some potential problems and their suggested solutions are:

**The Firmware and BIOS revisions typically need to be in sync for proper operation.**

Check with LSI Logic Technical Support to make sure that the Firmware is the correct version to use with your BIOS. If the Firmware revision is not in sync with the BIOS revision, system failures may occur.

**How do you identify the version number of the Firmware?**

The UNIX-compatible `WHAT.EXE` program for DOS included on your distribution media can be used to identify the ROM files on the diskette(s).

Examples:

```
what *.*
```

```
what *.* nt/*.*
```

**Many types of errors are reported through the LED on the LSI Logic Host Adapter boards.**

When these errors occur, the LED flashes a four-digit sequence, which is the error code. These types of errors should be reported to LSI Logic Technical Support. The technical support person will ask for additional system configuration information, including the type of system used, the FC configuration and type of peripherals (including version numbers), and the sequence of events when the error occurred.



# Chapter 4

## BIOS Features

---

This chapter describes the Fibre Channel BIOS and Configuration Utility and includes these topics:

- [Section 4.1, "Intel BIOS," page 4-1](#)
- [Section 4.2, "Starting the Intel BIOS Configuration Utility," page 4-3](#)
- [Section 4.3, "Using the Intel BIOS Configuration Utility," page 4-3](#)
- [Section 4.4, "Main Menu," page 4-3](#)
- [Section 4.5, "Exiting the Intel BIOS Configuration Utility," page 4-6](#)
- [Section 4.6, "Troubleshooting," page 4-6](#)
- [Section 4.7, "Open Boot BIOS," page 4-7](#)

A BIOS is the ROM code that is loaded by the system to facilitate booting from Fibre Channel drives. The BIOS also contains an embedded configuration manager, used to configure options provided by the firmware. The LSI Logic BIOS integrates with a standard system BIOS, extending the standard disk service routine provided through INT13h.

Two types of BIOS are available for the LSI Logic host adapters:

- An Intel BIOS for Intel-based platforms, and
- Open Boot BIOS for Solaris SPARC platforms.

Both Intel and Open Boot BIOS concurrently reside on the boards.

---

### 4.1 Intel BIOS

This section provides the features, description, and installation of the Intel Fibre Channel BIOS.

### **4.1.1 Intel BIOS Features**

The LSI Logic FC Intel BIOS supports:

- Selection and Configuration for up to 256 adapters
- Boot device selection from any four host adapters
- Automatic INT13 drive mapping for Fibre Channel drives

### **4.1.2 BIOS Overview**

During the boot time initialization, the Intel BIOS determines if there are other hard disks, such as an IDE drive, already installed by the system BIOS. If there are, the Intel BIOS maps any Intel drives it finds after the drive(s) already installed. Otherwise, the Intel BIOS installs drives starting with the system boot drive. In this case, the system boots from a drive controlled by the Intel BIOS.

### **4.1.3 Intel BIOS Boot Specification (BBS)**

The Intel BIOS provides support for the BIOS Boot Specification (BBS), which allows you to choose which device to boot from by selecting the priority.

To use this feature, the system BIOS must also be compatible with the BBS. If your system supports the BBS, then you will use the system BIOS setup menu to select the boot and drive order. In the system BIOS setup, the Boot Connection Devices menu appears with a list of available boot options. Use that menu to select the device and rearrange the order. Then exit to continue the boot process.



## 4.2 Starting the Intel BIOS Configuration Utility

The LSI Logic Intel BIOS allows you to change the default configuration of your host adapters, using the embedded BIOS Configuration Utility.

When the BIOS loads, the following message appears on your monitor:

Press Ctrl-C to start LSI Logic Configuration Utility...

This message remains on your screen for about five seconds, giving you time to start the utility. After you press Ctrl-C, the message changes to:

Please wait, invoking LSI Logic Configuration Utility...

After a brief pause, your computer monitor displays the Main menu of the BIOS Configuration Utility.

Note: Not all devices detected by the Configuration Utility can be controlled by the BIOS. Devices such as tape drives and scanners require that a device driver specific to that peripheral be loaded. The BIOS Configuration Utility does allow parameters to be modified for these devices.

---

## 4.3 Using the Intel BIOS Configuration Utility

This section provides the menu formats and user inputs available to inform users about the Intel BIOS Configuration Utility prior to running it. All BIOS Configuration Utility screens that display various menus are partitioned into fixed areas. This area provides static general help text information.

---

## 4.4 Main Menu

When you invoke the LSI Logic Intel BIOS Configuration Utility, the Main menu appears. This screen displays a scrolling list of up to 256 host adapters in the system and information about each of them.

Use the arrow keys to highlight an adapter. Then, press **Enter** to view and modify the selected adapter's properties (and to gain access to the

attached devices). After selecting an adapter and pressing **Enter**, the FC Link bus is scanned and the Adapter Properties screen appears.

On the Main menu, two selections are the Boot Adapter List and Global Properties menus.

Boot Adapter List allows selection and ordering of boot adapters. Refer to [Section 4.4.4, "Boot Adapter List Menu," page 4-5](#), for more detailed information.

Global Properties allows changes to global scope settings. Refer to [Section 4.4.5, "Global Properties Menu," page 4-6](#), for more detailed information.

Only adapters with LSI Logic Control enabled can be accessed.

#### **4.4.1 Adapter Properties Menu**

The Adapter Properties menu allows you to view and modify adapter settings. It also provides access to an adapter's device settings. To display this menu, select a device under the Adapter field on the Main menu and press **Enter**.

#### **4.4.2 Persistent IDs Menu**

The Persistent ID screen is used simply to review the automatic mapping between a drive WorldWide Name and its assigned logical SCSI bus and target ID. The screen can also be used to force a drive to a specific logical Target ID.

Selecting **Add WWN** at an unused location clears out the associated WWN/DID field and allows the user to enter the first 16 characters of the WWN. Pressing **<Enter>** afterwards allows the last 16 characters to be entered. The CU automatically adds any leading zeros, if necessary. If an entry was put in by mistake, selecting **Erase** on the appropriate line removes the entry.

Logical ID selection defaults to be the lowest ID available. This can be changed by using the **<+>** or **<->** keys to cycle the numbers. The Bus field always defaults to 0 and cannot be changed. It is displayed in the case where an outside utility had reserved a different number.

Next Page and Previous Page options are provided on the persistent ID screens, through the F2 key, which moves the screen forward or back by 16 entries. However, the CU requires that any modifications to the current page be stored before new entries may be viewed or modified. A pop-up confirmation window asks to store or discard changes, if needed.

### 4.4.3 Device Properties Menu

The Device Properties menu allows you to view and update individual device settings for an adapter.

**Note:** The number of fields on the menu requires that you scroll left/right to view all the information. When accessing this menu, use the Home/End keys to scroll to columns currently not displayed. The scroll indicator on the bottom of the menu shows where the cursor is, relative to the first and last columns.

### 4.4.4 Boot Adapter List Menu

The Boot Adapter List menu specifies the order in which adapters boot when more than one LSI Logic host adapter is in a system. Up to four adapters in a system can be selected as bootable. Only one of the four bootable adapters can be used to control a Boot Volume.

To select this menu:

1. Press **F2** while on the Main menu to move the cursor to the menu area.
2. Move the cursor to Boot Adapter List with the arrow keys.
3. Press **Enter**.

Adapters can be added or deleted using this menu. To add an adapter to the boot list, press the **Insert** key while on the Boot Adapter List. Use the arrow keys to select the desired adapter and press **Enter** to add it to the end of the Boot Adapter List.

To remove an adapter from the boot list, press the **Delete** key while the desired adapter is selected in the Boot Adapter List. You can also change the boot order by using the "+" or "-" keys. For example, place the cursor on the adapter that you want to change, and use the "+" or "-" key to raise or lower the boot order.

## 4.4.5 Global Properties Menu

The Global Properties menu allows you to pause if an alert message has been displayed, to view display boot information, and to set display and video modes.

---

## 4.5 Exiting the Intel BIOS Configuration Utility

The Exit menu for the Intel BIOS Configuration Utility is used for all five of the menus listed above. However, the available functionality is different for the Main menu and the four subordinate menus.

To exit from the Adapter Properties, Device Properties, Boot Adapter List, or Global Properties menus, use these exit options:

<b>Cancel exit</b>	This option returns you to the previous menu.
<b>Save changes then exit this menu</b>	This option implements any changes you made on the previous menu and returns you to the Main menu.
<b>Discard changes then exit this menu</b>	This option restores the default settings and returns you to the Main menu.

To exit from the Main menu, use these exit options:

<b>Cancel exit</b>	This returns you to the Main menu.
<b>Exit the Configuration Utility</b>	This option exits the configuration and automatically reboots your system.

**Important:** If you reboot the system without properly exiting from this utility, some changes may not take effect.

---

## 4.6 Troubleshooting

The LSI Logic Intel BIOS Configuration Utility is a powerful tool. If, while using it, you somehow disable all of your controllers, pressing **Ctrl-A** or **Ctrl-E** after memory initialization during reboot allows you to re-enable and reconfigure.

These messages may appear during the boot process:

- Adapter removed from boot order, parameters will be updated accordingly! appears when an adapter is removed from the system or is relocated behind a PCI bridge. This message is for information only, and no further user action is required.
- Configuration data invalid, saving default configuration! appears if none of the information in NonVolatile Random Access Memory (NVRAM) is valid. This message is for information only, and can occur when the BIOS is upgraded, or when some external event has rendered the NVRAM temporarily unreadable.
- Found FC Controller not in following Boot Order List, to Add: Press Ctrl-C to start LSI Logic Configuration Utility... appears when fewer than four adapters are in the boot order and adapters exist in the system which are not in the boot order. This message is for information only, and indicates that more than four adapters exist in the system. The additional adapters will not be managed by the Configuration Utility.

---

## 4.7 Open Boot BIOS

LSI Logic Solaris-capable Fusion-MPT host adapters have Fcode resident on board, allowing operation under Sun Microsystem's openboot console. All basic functionality is available at openboot, including the ability to display devices connected to the adapter, and to boot devices on the adapter.

### 4.7.1 Open Boot BIOS Features

The LSI Logic FC Open Boot BIOS supports:

- Solaris Sparc 2.6, 2.7, and Solaris 8 Open Firmware environments
- Root Boot device selection from any target device
- Standard command line interface, with help query
- Configuration options and selection for each host adapter

## 4.7.2 Identifying the Fibre Channel Disks

The `probe-scsi-all` command is used to identify the Fibre Channel devices on your Fusion-MPT adapter.

To show all disks available from the openboot prompt, use the `probe-scsi-all` command. Note that this command is used regardless of whether the disks are Fibre Channel or SCSI. All disks available on all Fusion-MPT devices are displayed.

The following example shows the kind of information that is displayed when you enter this command.

```
ok probe-scsi-all
```

```
/pci@8,600000/SUNW,qlc@4
```

```
LiD HA LUN ---Port WWN--- ----Disk description----
```

```
1 1 0 2100002037e4d65b SEAGATE ST318304FSUN18G 0726
```

```
/pci@8,700000/IntraServer-Ultra160,scsi@3,1
```

```
/pci@8,700000/IntraServer-Ultra160,scsi@3
```

```
Target 0
```

```
Unit 0 Disk IBM DDRS-34560D DC1B
```

```
/pci@8,700000/IntraServer,fc@2
```

```
MPT Version 1.00, Firmware Version 1.02.00
```

```
Target 0
```

```
Unit 0 Disk SEAGATE ST39173FC 6615  
WWN 2100002037109d76 Port ID d9
```

```
Target 1
```

```
Unit 0 Disk SEAGATE ST39173FC 6258  
WWN 210000203710565a Port ID 17
```

```
Target 2
```

```
Unit 0 Disk SEAGATE ST39173FC 6258  
WWN 2100002037105212 Port ID 1
```

```
Target 3
```

```
Unit 0 Disk SEAGATE ST39173FC 6258  
WWN 2100002037103da8 Port ID 26
```

```
Target 4
```

```
Unit 0 Disk SEAGATE ST39173FC 6258  
WWN 210000203710324a Port ID 73
```

```
/pci@8,700000/scsi@6
```

Target 6

Unit 0 Removable Read Only device PLEXTOR CD-ROM PX-20TS

If the Fibre Channel devices on your LSI Logic IntraServer™ adapter are not identified by your system, check the following:

- Is the Fibre Channel enclosure powered ON?
- Does the LED on the adapter indicate LINK? (Note that LINK is valid only after the device is probed.)
- Does the LED on the switch or remote enclosure indicate LINK?
- Does the LINK-SPEED parameter selected by the adapter match that of the bus (1G, 2G, or Auto)?

If you do not see disks, the following additional debug information may help to identify the problem.

### 4.7.3 Verifying Correct Installation

Use this procedure to verify installation of your Fusion-MPT adapter in the system:

- Step 1. Power on the system.
- Step 2. When the banner is displayed, press the **Stop-A** keys to interrupt the boot process and stop at the **ok** prompt.
- Step 3. Use the **show-devs** command to list the system devices. You should see an output similar to the following:

```
ok show-devs

/SUNW,UltraSPARC-III@0,0
/virtual-memory
/memory@m0,0
/aliases
/options
/openprom
/chosen
/packages
/upa@8,480000/SUNW,ffb@0,0
...
/pci@8,700000/IntraServer,fc@2
/pci@8,700000/IntraServer,fc@1,1
/pci@8,700000/IntraServer,fc@1
...
```

```
/pci@8,700000/IntraServer,fc@2/disk  
/pci@8,700000/IntraServer,fc@2/tape  
/pci@8,700000/IntraServer,fc@1,1/disk  
/pci@8,700000/IntraServer,fc@1,1/tape  
/pci@8,700000/IntraServer,fc@1/disk  
/pci@8,700000/IntraServer,fc@1/tape  
/pci@8,700000/scsi@6,1/tape  
/pci@8,700000/scsi@6,1/disk
```

**ok**

- `/pci@8,700000/IntraServer,fc@1`  
identifies the *first* Fibre Channel interface on an LSI Logic LSIFC929X-based adapter.
- `/pci@8,700000/IntraServer,fc@1,1`  
identifies the *second* Fibre Channel interface on an LSI Logic LSIFC929X-based adapter.
- An LSI Logic LSIFC919-based adapter will show only one such Fibre Channel device.

Note: The above are examples. The output of `show-devs` may vary depending on your system and configuration. Use the corresponding entries on your system, not the ones given here.

If these devices are not listed, check to assure that the adapter is correctly installed, and re-seat the adapter in the PCI slot if necessary.

## 4.7.4 Adapter-Specific Settings

In certain circumstances, the advanced user may want to change settings for an individual adapter or port, without affecting the other adapters in the system. Specific examples of such settings are Fibre Channel bus speed, host adapter ID (SCSI only: Not Applicable to Fibre Channel), and Interrupt Coalescing.

To select a specific Fusion-MPT adapter as the current adapter, use the `select` command. Selecting a port or adapter brings the port online, and allows you to show or set certain adapter specific parameters.

You should use caution while issuing the following commands, as some commands could render the bus unusable (such as forcing 1 Gbit/s operation on a 2 Gbit/s Fibre Channel loop).



#### 4.7.4.1 select

Use the **select** openboot command to select the adapter entry. This opens the port to bring the port online.

```
ok select /pci@8,700000/IntraServer,fc@1
```

#### 4.7.4.2 .properties

Use **.properties** to show the adapter properties.

```
ok .properties
```

```
firmware-version      1.02.00
mpt-version           1.00
scsi-initiator-id     00 00 00 0f
assigned-addresses    81001010 00000000 00000700 00000000 00000100
                     83001014 00000000 001a0000 00000000 00020000
                     8300101c 00000000 00190000 00000000 00010000
                     82001030 00000000 02000000 00000000 00100000
compatible            70 63 69 31 33 65 39 2c 36 32 31 00 70 63 69 31
model                 LSI,929
reg                   00001000 00000000 00000000 00000000 00000000
                     01001010 00000000 00000000 00000000 00000100
                     03001014 00000000 00000000 00000000 00020000
                     0300101c 00000000 00000000 00000000 00010000
                     02001030 00000000 00000000 00000000 00100000
version               1.00.16
device_type           scsi-2
name                  IntraServer,fc
fcode-rom-offset      00000000
66mhz-capable
devsel-speed          00000001
class-code            00010000
interrupts            00000001
latency-timer         00000040
cache-line-size       00000010
max-latency           00000008
min-grant              0000001e
subsystem-id          00000621
subsystem-vendor-id   000013e9
revision-id           00000001
device-id              00000621
vendor-id              00001000
```

#### 4.7.4.3 show-children

While you have the adapter or port selected, to display the devices currently connected to this adapter, use the **show-children** command, as shown below.

First, select the port or adapter shown (use the port name your system assigns):

```
ok select /pci@8,700000/IntraServer,fc@1
```

```
ok show-children
```

```
MPT Version 1.00, Firmware Version 1.02.00
```

```
Link is ready, port is online
```

```
WWN 100000a0b8040353 Port ID ef
```

```
Target 0
```

```
Unit 0 Disk SEAGATE ST39173FC 6615
```

```
WWN 2100002037109d76 Port ID d9
```

```
Target 1
```

```
Unit 0 Disk SEAGATE ST39173FC 6258
```

```
WWN 210000203710565a Port ID 17
```

```
Target 2
```

```
Unit 0 Disk SEAGATE ST39173FC 6258
```

```
WWN 2100002037105212 Port ID 1
```

```
Target 3
```

```
Unit 0 Disk SEAGATE ST39173FC 6258
```

```
WWN 2100002037103da8 Port ID 26
```

```
Target 4
```

```
Unit 0 Disk SEAGATE ST39173FC 6258
```

```
WWN 210000203710324a Port ID 73
```

#### 4.7.5 Interrupt Coalescing

Interrupt coalescing allows the firmware on the Fusion-MPT device to group I/Os together for the purpose of minimizing the overhead to the host system. This feature can result in significant performance benefits when I/Os are coming into the adapter rapidly—for example, when performing small sequential reads from a disk.

LSI Logic has performed significant testing under multiple I/O conditions, and has determined that the interrupt coalescence values that are beneficial over a wide range of I/O conditions are a depth of 9, with a

timeout of 1280 (0x500) microseconds. What this means is that the host is interrupted only once for 9 I/Os processed by the chip, unless 1280 microseconds has passed since the host was last interrupted.

Although LSI Logic has determined that these settings are optimal for a wide variety of situations, your own I/O load may benefit from a deeper queue, or a longer timeout. LSI Logic provides a mechanism to modify these values and write them to the non-volatile EEPROM on the adapter.

Select the port or adapter shown (use the port name your system assigns):

```
ok select /pci@8,700000/IntraServer,fc@1
```

Then enter commands as shown in the following example:

```
ok show-interrupt-coalescing
```

```
Interrupt coalescing timeout is 500 (1280 decimal) microseconds
Interrupt coalescing depth is 9 (9 decimal)
```

```
ok set-interrupt-coalescing <- command with no arguments prints help
```

```
usage is <timeout><depth> set-interrupt-coalescing
```

```
ok 100 8 set-interrupt-coalescing
```

```
Interrupt coalescing timeout selected is 100 (256 decimal) microseconds
Interrupt coalescing depth selected is 8 (8 decimal)
Interrupt coalescing has been set
Change will take effect after system reset
```

**Note:** The system must be power cycled before the changes take effect. It is not sufficient to execute the **reset-all** command.

## 4.7.6 Set Fibre Channel Link Speed

There are two modes of operation for Fibre Channel, 1 Gbit/s and 2 Gbit/s. It is important to match the speed of the port with the speed of the loop or fabric to which the port is attached.

LSI Logic has implemented auto-negotiation on the 2 Gbit/s capable Fusion-MPT devices. If you are experiencing difficulty with the auto negotiate algorithm on your fabric or loop, or if you wish to manually set or show the link speed for the adapter, use the following procedure:

Select the port or adapter shown (use the port name your system assigns):

```
ok select /pci@8,700000/IntraServer,fc@1
```

Then enter commands as shown in the following example:

```
ok show-link-speed
```

Link speed selected is 1 Gbaud

Current link speed is 1 Gbaud

```
ok set-link-speed <- command with no arguments prints help
```

usage is <link-speed> set-link-speed

```
ok a set-link-speed
```

Link speed selected is autobaud

Link speed has been set

Change will take effect after system power cycle

```
ok show-link-speed
```

Link speed selected is autobaud

Current link speed is 1 Gbaud

Note: The system must be power cycled before the changes take effect. It is not sufficient to execute the **reset-all** command.

## **4.7.7 Persistent Device Naming**

Under certain configurations, such as when the Fibre Channel disk is the system's boot device, it may be preferable to lock a target disk to a unit number. LSI Logic IntraServer Fcode allows the system administrator to write a non-volatile map of IDs to the Fibre Channel controller.

The following is an example of how to map devices in the persistent device table.

Select the controller you want to modify, as shown in the following example:

```
ok show-disks
```

a) /pci@1f,0/pci@1/IntraServer,fc@2/disk

b) /pci@1f,0/pci@1/IntraServer,Ultra2-scsi@1/disk

c) /pci@1f,0/pci@1,1/ide@3/cdrom

```
d) /pci@1f,0/pci@1,1/ide@3/disk
e) /pci@1f,0/pci@1,1/ebus@1/fdthree@14,3203f0
q) NO SELECTION
```

```
Enter Selection, q to quit: a
/pci@1f,0/pci@1/IntraServer,fc@2/disk has been selected.
```

```
Type ^Y ( Control-Y ) to insert it in the command line.
e.g. ok nvalias mydev ^Y for creating devalias mydev for
/pci@1f,0/pci@1/IntraServer,fc@2/disk
```

```
ok select /pci@1f,0/pci@1/IntraServer,fc@2
ok show-children
```

MPT Firmware Version 1.00

```
Target 0
  Unit 0      Disk  SEAGATE ST39173FC    6615
  WWN 200000203710c4e8  PortID a3
```

```
ok set-persistent  <- command with no arguments prints help
```

usage is <current-target-id> <persistent-target-id> set-persistent

```
ok 0 0 set-persistent
```

```
ok show-persistent
```

```
Entry 1  WWN 200000203710c4e8  Target 0
```

To clear an entry in the persistent device map, use the clear-persistent command:

```
ok 1 clear-persistent
```

Entry 1 has been cleared

```
ok show-persistent
```

```
ok
```

Entry 1 has been deleted from the table, and the table is now empty.

## **4.7.8 Manual Selection of Fibre Channel Topology**

Under certain configurations, it may be desired to force the selection of Fibre Channel topology, and disable the auto detect mechanism in the Fibre Channel adapter. This can be done on a port by port basis, by using the following procedure. Note that it should not be necessary to

change from auto detect of topology, and that firmware version 1.00.03 is the minimum revision to support this functionality.

The following is an example of how to select a manual topology N\_Port or NL\_Port on a selected Fibre Channel port.

Select the controller you want to modify, as follows:

**ok show-disks**

```
a) /pci@1f,0/pci@1/IntraServer,fc@2/disk
b) /pci@1f,0/pci@1/IntraServer,Ultra2-scsi@1/disk
c) /pci@1f,0/pci@1,1/ide@3/cdrom
d) /pci@1f,0/pci@1,1/ide@3/disk
e) /pci@1f,0/pci@1,1/ebus@1/fdthree@14,3203f0
q) NO SELECTION
```

```
Enter Selection, q to quit: a
/pci@1f,0/pci@1/IntraServer,fc@2/disk has been selected.
```

```
Type ^Y ( Control-Y ) to insert it in the command line.
e.g. ok nvalias mydev ^Y for creating devalias mydev for
/pci@1f,0/pci@1/IntraServer,fc@2/disk
```

**ok select /pci@1f,0/pci@1/IntraServer,fc@2**

Then enter commands as shown in the following example:

**ok show-topology**

```
Topology selected is auto
Current topology is unknown (no link)
```

**ok set-topology <-Command with no options provides help**

```
usage is <topology> set-topology
```

```
topology = 1      NL_Port
           topology = 2      N_Port
           topology = a      auto
```

**ok 1 set-topology**

```
Topology selected is NL_Port
Topology has been set
```

Change will take effect after system power cycle

**ok 2 set-topology**

Topology selected is N\_Port

Topology has been set

Change will take effect after system power cycle

**ok a set-topology**

Topology selected is auto

Topology has been set

Change will take effect after system power cycle

**Note:** The system must be power cycled before the changes take effect. It is not sufficient to execute the **reset-all** command.





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